

**Commonwealth of Kentucky**  
**Division for Air Quality**  
***PERMIT STATEMENT OF BASIS***

DRAFT

Title V / Synthetic Minor, Operating / Construction

Permit: V-08-014

University of Kentucky

Lexington, KY 40506

June 25, 2008

Herbert Campbell, Reviewer

SOURCE ID: 21-067-00003

AGENCY INTEREST: 1104

ACTIVITY: APE20080001

**SOURCE DESCRIPTION:**

On March 27, 2008, the University of Kentucky applied to the Division for the renewal permit of their existing permit [V-03-023 R2] for their facility in Lexington, Kentucky. The University of Kentucky (UK) is a public education institution that has a Title V operating permit, V-03-023 Revision 2, covering its main campus in Lexington Kentucky. UK is permitted to operate 23 indirect heat exchangers larger than 1.0 MMBtu/hr, 66 indirect heat exchangers 1.0 MMBtu/hr or less, 81 backup diesel generators, 2 paint booths and additional insignificant activities. The plant is classified as a Title V, Synthetic Minor source due to its having potential emissions of regulated air pollutants nitrogen oxides (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>) and carbon monoxide (CO), greater than a major source threshold. This permit contains practically enforceable limit to preclude the applicability of Prevention of Significant Deterioration of Air (PSD), 401 KAR 51:017. The permittee is requesting limited paint usage for the paint booths located in the Reynolds Building, Transportation Research Center and the Medical Center (formerly EUI 49 &50) to less than 200 gallons per year. Additionally, these units are now classified as insignificant units due to the limitation, and the potential emissions of any regulated air pollutant from each unit shall not exceed five tons per year.

In Revision 2, the five diesel fired emergency generators, emission units (EU) 60, 61, 62, 67, and 68 were permitted as 2885 horsepower, with 500 hours per year operation. However, upon site inspection, the Division for Air Quality (DAQ) noted that EU 60, 61 and 62, which have been operational since March 2007, were purchased at 3286 horsepower, while EU 67 and 68 have not been installed yet. The permittee resubmitted a revised application on July 9, 2008 for the upgraded emergency generators, with calculation based on AP-42 emission factors reducing the hours and limited the hours of 500 for the five units. The source has also decommissioned a 1004 HP (746 KW) diesel generator which was one of emission unit 54 (eight generators). This has been replaced by a smaller generator at a capacity of 755HP or 450 KW (4.3 MMBtu/hr), and will be identified as emission unit 69. The calculation using emission factors from AP-42 and reduced hours per year for all five units shows that the emissions are lower than the previously submitted calculation. Also the emissions are below significant emission rate (SER) and Prevention of Significant Determination (PSD) thresholds [401 KAR 51:001]. The applicable regulation for EU's 60, 61, 62, 67, 68 and 69 will be the same as that from the last permitting action. All 502(b)10/off permit changes have also been incorporated into this renewal permit.

**APPLICABLE REGULATIONS**

401 KAR 60:005, incorporating by reference 40 CFR 60 Subpart Db, Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units, applicable to an emission unit with a heat input capacity of greater than 100 MMBtu/hr and commences construction, modification, or reconstruction after June 19, 1984, applies to Emission Units 15,16, 51 & 52.

401 KAR 60:005, incorporating by reference 40 CFR 60 Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, applicable to an emission unit with a design maximum heat input capacity of 100 MMBtu/hr or less and greater than or equal to 10 MMBtu/hr and constructed after June 9, 1989, applies to Emission Units 51 & 52.

401 KAR 61:015, Existing Indirect Heat Exchangers applicable to an emission unit with a capacity less than 250 MMBtu/hour and commenced on or before April 9, 1972, applies to Emission Units 1, 2, 9, 10, 22 through 48.

401 KAR 59:010, New process operations applicable to affected sources commenced on or after July 2, 1975, applies to Emission Units 49, 50.

401 KAR 59:015, New Indirect Heat Exchangers applicable to an emission unit with a capacity less than 250 MMBtu/hour and commenced on or after April 9, 1972, applies to Emission Units 13(3 & 4), 15, 16, 20, 21, 57.

40 CFR 60 Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, commencing construction (order placed date) after July 11, 2005 and manufactured after April 1, 2006, applies to Emission Units 60, 61, 62, 67, & 68.

**NON-APPLICABLE REGULATIONS**

Section 112(j) of the Clean Air Act. Permittee has elected to accept voluntary federally enforceable operating and emission limits to preclude applicability of these standards.

40 CFR 60 Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, commencing construction (order placed date) after July 11, 2005 and manufactured after April 1, 2006, does not apply to Emission Units 63, 64, 65, & 66 due to the manufacture date of these units.

40 CFR 60 Subpart Kb, Standards of Performance for Organic Volatile Liquid Storage Vessels (including Petroleum Liquid Storage Vessels) commencing construction after July 23, 1984, does not apply to TK 70, 71, 72, & 73 due to the size of the tanks and the maximum true vapor pressure of the fuel oil being less than 15.0 kPa.

**SIGNIFICANT EMISSION UNITS****Emission Units 01, 02, 09 & 10****Natural Gas/Oil Fired Indirect Heat Exchangers**

Units 01 & 02 Maximum Continuous Rating: 125 MMBtu/hr, Primary fuel: Natural Gas  
Secondary Fuel: #2 Fuel Oil, installed in 1971

Units 09 & 10 Maximum Continuous Rating: 144 MMBtu/hr, Primary fuel: Natural Gas  
Secondary Fuel: #2 Fuel Oil, installed in 1970

Pursuant to 401 KAR 61:015, Section 4, particulate emissions shall not exceed 0.29 lb/MMBtu based on a three-hour-average. Compliance with the allowable particulate emission limitation while burning #2 fuel oil may be demonstrated by calculating emissions using the following formula:

$$\text{PM emissions (lb/MMBtu)} = 2.0 \text{ lbs/ 103 gallons} * / (**)$$

\* = AP-42 Emission Factor

\*\* = #2 Fuel oil heating value in MMBtu/103 gallons

Pursuant to 401 KAR 61:015, Section 4 (3), emissions shall not exceed 40 percent opacity with respect to particulate matter based on a six-minute average.

Pursuant to 401 KAR 61:015, Section 4 (3)(c), emissions from an indirect heat exchanger shall not exceed 40 percent opacity based on a six minute average except during building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturer's recommendations.

Pursuant to 401 KAR 61:015, Section 5(1), sulfur dioxide emissions shall not exceed 4.0 lb/MMBtu based on a twenty-four-hour average.

Each unit is considered to be in compliance with the PM, SO<sub>2</sub>, and opacity standards while burning natural gas, and in compliance with the SO<sub>2</sub> limit while burning fuel oil as long as the sulfur content of the fuel oil is less than or equal to 0.5% by weight. If fuel oil of over 0.5% sulfur is used, the Division shall be notified immediately and a compliance demonstration will be required.

**Emission Units 22 through 48****Indirect Heat Exchangers****Ranging between >1 & 10 < MMBtu/hr**

Units 22 – 33 Maximum Continuous Rating: 1.25 MMBtu/hr, Primary fuel: Natural Gas  
Secondary Fuel: #2 Fuel Oil, installed in 1956

Units 34 & 35 Maximum Continuous Rating: 1.25 MMBtu/hr, Primary fuel: Natural Gas  
Secondary Fuel: #2 Fuel Oil, Construction Commenced: 1955

Units 39 & 40 Maximum Continuous Rating: 1.00 MMBtu/hr, Primary fuel: Natural Gas  
Secondary Fuel: #2 Fuel Oil, installed in 1955

Units 41 – 44 Maximum Continuous Rating: 1.125 MMBtu/hr, Primary fuel: Natural Gas  
Secondary Fuel: #2 Fuel Oil, installed in 1955

Units 45 – 48 Maximum Continuous Rating: 1.250 MMBtu/hr, Primary fuel: Natural Gas  
Secondary Fuel: #2 Fuel Oil, installed in 1955

Pursuant to 401 KAR 61:015, Section 4, particulate emissions shall not exceed 0.29 lb/MMBtu, each based on a three-hour-average. Compliance with the allowable particulate emission limitation while burning #2 fuel oil may be demonstrated by calculating emissions using the following formula:

PM emissions (lb/MMBtu) = 2.0 lbs/ 10<sup>3</sup> gallons \* / (\*\*)

\* = AP-42 Emission Factor

\*\* = #2 Fuel oil heating value in MMBtu/10<sup>3</sup> gallons.

Pursuant to 401 KAR 61:015, Section 4 (3), emissions shall not exceed 40 percent opacity with respect to particulate matter based on a six-minute average.

Pursuant to 401 KAR 61:015, Section 4 (3)(c), emissions from an indirect heat exchanger shall not exceed 40 percent opacity based on a six minute average except during building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturer's recommendations.

Pursuant to 401 KAR 61:015, Section 5(1), sulfur dioxide emissions shall not exceed 4.0 lb/MMBtu, each based on a twenty-four-hour average.

Each unit is considered to be in compliance with the PM, SO<sub>2</sub>, and opacity standards while burning natural gas, and in compliance with the SO<sub>2</sub> limit while burning fuel oil as long as the fuel oil is less than or equal to 0.5% by weight. If fuel oil over 0.5% sulfur is used, the Division shall be notified immediately and a compliance demonstration will be required.

### **Emission Units 07 & 08**

### **Coal Fired Indirect Heat Exchangers**

Units 7 & 8 Maximum Continuous Rating: 75.0 MMBtu/hr each boiler, Control Device: Cyclone with a 92% efficiency, installed in 1958

To preclude Section 112(j) of the Clean Air Act, the source-wide usage rate of coal from all affected facilities shall not exceed 47,250 tons per year (12 month rolling total) and shall further be restricted so the emission limitations of source-wide emissions of Hydrogen Chloride (Single Hazardous Air Pollutant (HAP)) shall not exceed 9.0 tons in any consecutive twelve months period and source-wide emissions of Total Hazardous Air Pollutants (HAPs) shall not exceed 22.5 tons in any consecutive twelve months period.

Pursuant to 401 KAR 61:015, Section 4(1), particulate emissions shall not exceed 1.09 lb/MMBtu, each based on a three-hour average. The permittee may measure compliance with the particulate allowable by calculating the emissions using the following formula:

Compliance Demonstration Method:

Particulate Emission Rate = [EF] / [coal heating value (MMBtu/ton)] X [1-(CE/100)]

Where: EF is the emission factor in lb/ton from AP 42 1.1-4 until replaced with an approved

performance test emission factor  
CE is Cyclone Control Efficiency

Pursuant to 401 KAR 61:015, Section 4(3), opacity shall not exceed forty percent except that for stoker fired indirect heat exchangers, a maximum of sixty percent opacity shall be permissible for not more than six consecutive minutes in any sixty consecutive minutes during cleaning the fire box or blowing soot.

Pursuant to 401 KAR 61:015, Section 4(3)(c), emissions from an indirect heat exchanger shall not exceed 40 percent opacity based on a six minute average except during building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturer's recommendations.

Pursuant to 401 KAR 61:015, Section 5(1), the sulfur dioxide emissions shall not exceed 6.0 lb/MMBtu, each based on a twenty-four-hour average. The permittee may measure compliance with the sulfur dioxide allowable by calculating the emissions using the following formula:

Compliance Demonstration Method:

Sulfur Dioxide Emission Rate =  $[38S \text{ (lb/ton)}] / [\text{coal heating value (MMBtu/ton)}]$

Where S=% Sulfur

### **Emission Units 13 (3 & 4)**

### **2 Coal Fired Indirect Heat Exchangers**

Units 13 (3&4) Maximum Continuous Rating: 93.75 MMBtu/hr, each boiler Primary fuel: Coal  
Control Device: Cyclone, installed in 1977

To preclude Section 112(j) of the Clean Air Act, the source-wide usage rate of coal from all affected facilities shall not exceed 47,250 tons per year (12 month rolling total) and shall further be restricted so the emission limitations of source-wide emissions of Hydrogen Chloride (Single Hazardous Air Pollutant (HAP)) shall not exceed 9.0 tons in any consecutive twelve months period and source-wide emissions of Total Hazardous Air Pollutants (HAPs) shall not exceed 22.5 tons in any consecutive twelve months period.

Pursuant to 401 KAR 59:015, Section 4(1)(c), particulate emissions shall not exceed 0.20 lb/MMBtu, each based on a three-hour average. The permittee may measure compliance with the particulate allowable by calculating the emissions using the following formula:

Compliance Demonstration Method:

Particulate Emission Rate =  $[EF] / [\text{coal heating value (MMBtu/ton)}] \times [1-(CE/100)]$

Where: EF is the emission factor in lb/ton from AP 42 1.1-4 until replaced with an approved performance test emission factor. CE is Cyclone Control Efficiency

Pursuant to 401 KAR 59:015, Section 4(2)(b), opacity shall not exceed twenty percent except that a maximum of forty percent opacity shall be permissible for not more than six consecutive minutes in any sixty consecutive minutes during cleaning the fire box or blowing soot.

Pursuant to 401 KAR 59:015, Section 4(2)(c), emissions from an indirect heat exchanger shall not exceed 20 percent opacity based on a six minute average except during building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturer's recommendations.

Pursuant to 401 KAR 59:015, Section 5(1), the sulfur dioxide emissions shall not exceed 1.20, each lb/MMBtu, each based on a twenty-four-hour average. The permittee may measure compliance with the sulfur dioxide allowable by calculating the emissions using the following formula:

Compliance Demonstration Method:

Sulfur Dioxide Emission Rate =  $[38S \text{ (lb/ton)}] / [\text{coal heating value (MMBtu/ton)}]$

Where S=% Sulfur

### **Emission Units 20 & 21**

### **Natural Gas Fired Indirect Heat Exchangers**

Units 20 & 21 Maximum Continuous Rating: 2.5 MMBtu/hr each boiler

Pursuant to 401 KAR 59:015, Section 4, particulate emissions shall not exceed 0.26 lb/MMBtu, each based on a three-hour-average.

Pursuant to 401 KAR 59:015, Section 4(2)(b), opacity shall not exceed twenty percent except that a maximum of forty percent opacity shall be permissible for not more than six consecutive minutes in any sixty consecutive minutes during cleaning the fire box or blowing soot.

Pursuant to 401 KAR 59:015, Section 4(2)(c), emissions from an indirect heat exchanger shall not exceed 20 percent opacity based on a six minute average except during building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturer's recommendations.

Pursuant to 401 KAR 59:015, Section 5(1), sulfur dioxide emissions shall not exceed 0.74, each lb/MMBtu based on a twenty-four-hour average.

Each unit is considered to be in compliance with the PM, SO<sub>2</sub>, and opacity standards while burning natural gas.

### **Emissions Units 49 & 50     Paint Spray Booths**

Operating rate: 2.0 gal/hr for EU 49 & 50 Maintenance Shop Paint Spray Booth

The usage rate of raw materials in all affected facilities shall be restricted so the emission limitations as set forth below \* are not exceeded.

Pursuant to 401 KAR 59:010, Section 3(2), particulate emissions shall not exceed 2.34 lb/hr based on a three-hour-average.

Pursuant to 401 KAR 59:010, Section 3(1), visible emissions shall not equal or exceed 20 percent opacity.

\* There are no individual limits on Hazardous Air Pollutants (HAPs) for the affected facilities. Emission limitations are source wide, as given in Section D of the permit.

Compliance Demonstration Method: Maintenance of the affected facilities in accordance with manufacturer's recommendations and procedures shall suffice to demonstrate compliance with the emission standards.

### **Emission Units 51 & 52 (ST-51, SB-61) Two Indirect Heat Exchangers**

Maximum continuous rating: 72.3 MMBtu/hr, each, Primary Fuel: Natural Gas, Secondary Fuel: Fuel Oil #2, installed in 2004

To preclude the applicability of 401 KAR 51:017, Prevention of Significant Deterioration of Air Quality (PSD), heat input shall not exceed 72.3 MMBtu/hr, each. Maximum total annual (consecutive twelve (12) month) primary fuel consumption shall not exceed 624 MMCF/year for both units. Secondary fuel consumption shall not exceed 706,800 gallons per year for both units, and each unit shall be operated with a Lo-NO<sub>x</sub> burner at 30 ppm or 0.036 lb/MMBtu.

Pursuant to 401 KAR 59:015 Section 4(1)(c), Particulate emissions from each unit shall not exceed 0.1 lb/MMBtu, each based on a three-hour average.

Pursuant to 401 KAR 59:015 Section 4(2) and 401 KAR 60:005, incorporating by reference 40 CFR 60 Subpart Dc, visible emissions from each unit shall not exceed 20 percent opacity based on a six minute average, except for one six minute period per hour of not more than 27 percent opacity.

Pursuant to 401 KAR 59:015, Section 4(2)(c), emissions from an indirect heat exchanger shall not exceed 20 percent opacity based on a six minute average except during building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturer's recommendations.

Pursuant to 401 KAR 60:005, incorporating by reference 40 CFR 60.43c (d), the PM and Opacity standards apply at all times except during periods of startup, shutdown, or malfunction.

Pursuant to 401 KAR 59:015 Section 5 (1)(b) and 401 KAR 60:005, incorporating by reference 40 CFR 60 Subpart Dc, sulfur dioxide emissions shall not exceed 0.8 lb/MMBtu, on a twenty four hour average for each unit.

Each unit is considered to be in compliance with the PM, SO<sub>2</sub>, and opacity standards while burning natural gas and while burning fuel oil with a fuel sulfur content less than or equal to 0.5% by weight. If fuel oil of over 0.5% sulfur is used, the Division shall be notified immediately and a compliance demonstration will be required.

Pursuant to 401 KAR 52:020, Section 26, the permittee shall monitor the heating value and sulfur content of each type of fuel oil combusted whenever a new shipment of fuel oil is received. The permittee may use certifications from fuel suppliers to satisfy this requirement.

**Emission Units 53, 54, 55, & 56      Twenty-five Diesel Fired Emergency Generators  
(EG53, EG54, EG55, & EG56)**

EU 53 – Maximum Rating: One Unit at 2000 KW, (2885 HP) installed in 2004

EU 54 – Maximum Rating: Seven Units ranging between 587-2385 HP installed in 1973-2002

EU 55 – Maximum Rating: Nine Units ranging between 535-1502 HP installed in 1963-2003

EU 56 – Maximum Rating: Seven Units ranging between 47- 449 HP installed pre- 2004

Pursuant to 401 KAR 52:020, Section 26, the permittee shall monitor and maintain records of the amount of diesel fuel consumed and the hours of operation by each generator on a monthly basis.

**Emission Unit 57 (57)      Eight Natural Gas Fired Indirect Heat Exchangers  
Ranging between >1.0 & 9.0 < MMBtu/hour rating**

Maximum Continuous Rating: 2 MMBtu/hour average, installed between 1986-2002

For Transportation building, Nutter Field House, SAE fraternity building, Tennis building and the Pennsylvania Avenue buildings.

Pursuant to 401 KAR 59:015 Section 4(1)(b), particulate emissions shall not exceed 0.1 lb/MMBtu, each based on a three hour average.

Pursuant to 401 KAR 59:015 Section 4(2), visible emissions shall not exceed 20 percent opacity based on a six-minute average, except a maximum of forty (40) percent opacity shall be permissible for not more than six (6) consecutive minutes in any sixty (60) consecutive minute during cleaning of the firebox or blowing soot.

Pursuant to 401 KAR 59:015, Section 4(2)(c), emissions from an indirect heat exchanger shall not exceed 20 percent opacity based on a six minute average except during building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturer's recommendations.

Pursuant to 401 KAR 59:015 Section 5(1)(b), sulfur dioxide emissions shall not exceed 0.8 lb/MMBtu, each based on a three hour average.

Each unit is considered to be in compliance with the PM, SO<sub>2</sub>, and opacity standards while burning natural gas.

Pursuant to 401 KAR 52:020, Section 26, the permittee shall monitor and maintain records of the amount of fuel consumed and the hours of operation by each indirect heat exchanger on a monthly basis

**Emission Unit 58 (58)      Sixteen Natural Gas Fired Indirect Heat Exchangers  
Ranging equal to or less than 1.0 MMBtu/hour rating  
And Fifty Natural Gas Fired Water Heaters**



Maximum Continuous Rating: less than or equal to 1 MMBtu/hr installed between 1977-2002

Pursuant to 401 KAR 52:020, Section 26, the permittee shall monitor and maintain records of the amount of fuel consumed and the hours of operation by each indirect heat exchanger on a monthly basis

**Emission Unit 59 (59)                      Fifty-Seven Diesel Fired Emergency Generators  
Ranging between 8.0 & 300 KW (12 & 472 HP)**

Maximum Continuous Rating: 12 to 472 HP, installed 56 units prior to 2004 and 1 in 2007

For each emission unit, the usage rate of fuel oil (12 month rolling total) in all affected facilities shall be restricted so that the emission limitations set forth are not exceeded.

**Emission Units 15 & 16 (ST-15, ST-16)      Two Gas Fired Indirect Heat Exchangers**

2-125,000 lb/hr output, gas-fired, water-tube boilers with Ultra-Low NOx Burners

Maximum continuous rating: 150 MMBtu/hr, each Primary Fuel: Natural Gas, Secondary Fuel: Fuel Oil #2, ST 15 installed in 2007; ST-16 to be constructed in 2009

To preclude the applicability of 401 KAR 51:017, Prevention of Significant Deterioration of Air Quality (PSD), sulfur weight percent shall not exceed 0.3 percent for fuel oil and 2.0 grains/SCF for natural gas. The usage rate of fuel oil and natural gas in all affected facilities shall be restricted so that the emission limitations are not exceeded.

To preclude Section 112(j) of the Clean Air Act, the source-wide usage rate of fuel oil and natural gas from all affected facilities shall be restricted so that the emission limitations for hydrogen chloride (HCl) and total HAPS are not exceeded.

Pursuant to 401 KAR 60:005, incorporating by reference 40 CFR 60.43b h (5), on or after the date which the initial performance test is completed or is required to be completed under 40 CRF 60.8, whichever date comes first, an affected facility that combusts only oil that contains no more than 0.3 weight percent sulfur or other liquid or gaseous fuels with potential sulfur dioxide emission rates of 0.32 lb/MMBtu heat input or less is not subject to the PM or opacity limits of 40 CFR 60 Subpart Db.

Pursuant to 401 KAR 59:015, Section 4 (1)(b), particulate emissions shall not exceed 0.1 lb/MMBtu, each based on a three hour average. Each unit is considered in compliance with this particulate standard when burning natural gas and fuel oil containing no more than 0.3 percent weight sulfur following the successful completion of the initial compliance demonstration.

Pursuant to 401 KAR 59:015 Section 4(2)(b), visible emissions shall not exceed 20 percent opacity based on a six-minute average, except that a maximum of forty percent opacity shall be permissible for not more than six consecutive minutes in any sixty consecutive minutes during cleaning the fire box or blowing soot.

Pursuant to 401 KAR 59:015, Section 4(2)(c), emissions from an indirect heat exchanger shall not exceed 20 percent opacity based on a six-minute average, except during building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturer's recommendations.

Pursuant to 401 KAR 60:005, incorporating by reference 40 CFR 60.42b (k)(1), units firing only oil that contains no more than 0.3 weight percent sulfur or any individual fuel with a potential sulfur dioxide emission rates of 0.32 lb/MMBtu heat input or less are exempt from all other sulfur dioxide emission limits of 40 CFR 60 Subpart Db.

Pursuant to 401 KAR 59:015 Section 5(1)(b), sulfur dioxide emissions shall not exceed 0.8 lb/MMBtu, each based on a 30 day rolling average. Each unit is considered in compliance with this sulfur dioxide standard when burning natural gas or fuel oil containing no more than 0.3 percent weight sulfur.

Pursuant to 401 KAR 60:005, incorporating by reference 40 CFR 60.42b (e) and (g), compliance with the fuel oil sulfur limits are determined on a thirty (30) day rolling average basis and applies at all times including periods of startup, shutdown, and malfunction.

Pursuant to 401 KAR 60:005, incorporating by reference 40 CFR 60.44b (a)(1), on or after the date which the initial performance test is completed or is required to be completed under 40 CFR 60.8, whichever date comes first, no owner or operator of an affected facility shall cause to be discharged into the atmosphere any gases that contain nitrogen oxides in excess of 0.20 lb/MMBtu based on a thirty (30) day rolling average. The permittee may assure compliance with the nitrogen oxides emission standard by predicting emissions per the monitoring plan submitted to the Division.

Pursuant to 401 KAR 52:020, Section 26, the permittee shall record and maintain records of the amount and type of fuel burned with the hours of operation on a weekly basis.

Pursuant to 401 KAR 52:020, Section 26, the permittee shall maintain records of the fuel supplier certifications of the sulfur content and heating value of the fuels burned.

Pursuant to 401 KAR 60:005, incorporating by reference 40 CFR 60.49 (g), the permittee shall maintain records of the calendar day and average hourly nitrogen oxides emission rates predicted; the calculated 30-day average nitrogen oxides emission rates; and identification of days and reasons for excess nitrogen oxide emissions and/or missing data; and corrective actions taken.

The permittee shall maintain records of the fuel combusted in each unit in a monthly basis. For the purposes of precluding the applicability of PSD, a twelve-month rolling sum of sulfur dioxide emissions (TMSE) shall be kept for these units for use in tracking sulfur dioxide emissions due to combustion.

**\Emission Units 60, 61, 62, 67, 68 & 69****Five Diesel Fired Emergency Generators  
(ST-60, ST-61, ST-62, ST-67, ST-68 & ST 69)**

EU 60, 61, & 62 – Maximum Rating: One Unit Each at 2000 KW, (2885 HP, 4.3 L displacement per cylinder) installed in 2007, Medical Center

EU 67 & 68 – Maximum Rating: One Unit Each at 2000 KW, (2885 HP, 4.3 L displacement per cylinder) Proposed construction date: 2009, Physical Plant

EU 69- Maximum Rating: 450 KW (755 HP, 4.3 L displacement), installed in 2008

To preclude the applicability of 401 KAR 51:017, Prevention of Significant Deterioration of Air Quality (PSD), each emission unit shall not operate more than 500 hours per year (12 month rolling total) and shall be further restricted such that the total hours operating limit for these units is not exceeded. Additionally, the fuel oil usage rates (12 month rolling total) in all affected facilities shall be restricted so the emission limitations are not exceeded.

Pursuant to 40 CFR 60.4207 (a), beginning October 1, 2007, the permittee shall only use diesel fuel that meets the requirements of 40 CFR 80.510 (a).

Pursuant to 40 CFR 60.4207 (b), beginning October 1, 2010, the permittee shall use diesel fuel that meets the requirements of 40 CFR 80.510 (b) for nonroad diesel fuel.

Pursuant to 40 CFR 60.4205 (b) and 40 CFR 60.4202 (b), emissions from emergency stationary CI ICE with a displacement of less than 10 liters per cylinder, 2007 through 2010 model years and with a maximum engine power greater than 2,237 KW (3,000 HP), shall not exceed the following:

- (i) Hydrocarbon (HC) limit of 1.3 g/KW-hr or 1.0 g/HP-hr, except during periods of startup, shutdown or malfunction.
- (ii) Nitrogen oxide (NO<sub>x</sub>) limit of 9.2 g/KW-hr or 9.2 g/HP-hr, except during periods of startup, shutdown or malfunction.
- (iii) Carbon monoxide (CO) limit of limit of 11.4 g/KW-hr or 8.5g/HP-hr, except during periods of startup, shutdown or malfunction
- (iv) PM limit of limit of 0.54 g/KW-hr or 0.40 g/HP-hr., except during periods of startup, shutdown or malfunction

Pursuant to 40 CFR 60.4206, to assure compliance with the emission standards, owners and operators of stationary compression ignition (CI), internal compression engine (ICE) must operate and maintain stationary CI ICE according to the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer, over the entire life of the engine.

Pursuant to 401 KAR 52:020, Section 26, the permittee shall monitor, compile and maintain records of the hours of operation and the total amount of diesel fuel consumed by each generator on a monthly basis and on a consecutive twelve (12) month total.

**Emission Units 63, 64, 65, & 66      Four Diesel Fired Emergency Generators  
(ST-63, ST-64, ST-65, & ST-66)**

EU 63, 64 – Maximum Rating: One Unit Each at 250 KW, (390 HP) installed in 2005, North Dorm and South Dorm

EU 65 – Maximum Rating: One Unit at 150 KW, (277 HP) installed in: 2006, Memorial Coliseum

EU 66 – Maximum Rating: One Unit at 100 KW, (166 HP) installed in 2005, Parking Structure Sports Center Drive

To preclude 401 KAR 51:017, Prevention of Significant Deterioration of Air Quality, each emission unit shall not operate more than 500 hours per year (12 month rolling total) and shall be further restricted such that the total hours operating limit. Additionally, the fuel sulfur weight percent shall not exceed 0.3 percent for fuel oil, and the usage rate of fuel oil (12 month rolling total) in all affected facilities shall be restricted so the emission limitations are not exceeded.

Pursuant to 401 KAR 52:020, Section 26, the permittee shall monitor, compile and maintain records of the hours of operation and the total amount of diesel fuel consumed by each generator on a monthly basis and on a consecutive twelve (12) month total.

**EMISSION AND OPERATING CAPS DESCRIPTION:**

To preclude the applicability of 401 KAR 51:017, nitrogen oxide emissions from emission units 51, 52, and 53 shall not exceed 30 tons in any consecutive twelve months. NO<sub>x</sub> emissions from these units shall be calculated using the following equation:

NO<sub>x</sub> emissions (tons) = [AP-42 emission factor (lbs/1000 gallons fuel burned or lbs/10<sup>6</sup> standard cubic feet (scf or feet<sup>3</sup>) natural gas burned] x (1000 gallons or 10<sup>6</sup>scf) fuel burned per month / 2000 lbs/ton. To demonstrate compliance with this emission limitation, the total twelve-month rolling NO<sub>x</sub> emissions from emission units 51, 52, and 53 shall be calculated monthly and reported semi-annually.

To preclude the applicability of 401 KAR 51:017, sulfur dioxide emissions from emission units 51, 52, and 53 shall not exceed 26 tons in any consecutive twelve months. SO<sub>2</sub> emissions from these units shall be calculated using the following equation:

SO<sub>2</sub> emissions (tons) = [AP-42 emission factor (lbs/1000 gallons fuel burned or lbs/10<sup>6</sup>scf natural gas burned] x (1000 gallons or 10<sup>6</sup>scf) fuel burned per month / 2000 lbs/ton. To demonstrate compliance with this emission limitation, the total twelve-month rolling SO<sub>2</sub> emissions from emission units 51, 52, and 53 shall be calculated monthly and reported semi-annually.

To preclude the applicability of 401 KAR 51:017, carbon monoxide emissions from emission units 51, 52, and 53 shall not exceed 32 tons in any consecutive twelve months. CO emissions from emission units 51, 52, and 53 shall be calculated using the following equation:

CO emissions (tons) = [AP-42 emission factor (lbs/1000 gallons fuel burned or lbs/10<sup>6</sup>scf natural gas burned] x (1000 gallons or 10<sup>6</sup>scf) fuel burned per month / 2000 lbs/ton. To demonstrate compliance with this emission limitation, the total twelve-month rolling CO emissions from emission units 51, 52, and 53 shall be calculated monthly and reported semi-annually.

To preclude the applicability of 401 KAR 51:017, combined nitrogen oxide emissions from emission units 15, 16, 60, 61, 62, 63, 64, 65, 66, 67, 68 and 69 shall not exceed 36 tons in any consecutive twelve months. NO<sub>x</sub> emissions from these units shall be calculated using the following equation:

NO<sub>x</sub> emissions (tons) = [(AP-42 emission factor or vendor certified emission factor)(lbs/1000 gallons fuel burned or lbs/10<sup>6</sup>scf natural gas burned) x (1000 gallons or 10<sup>6</sup>scf) fuel burned per month / 2000 lbs/ton.

To demonstrate compliance with this nitrogen oxide emission limitation, the total twelve-month rolling NO<sub>x</sub> emissions from emission units 15, 16, 60, 61, 62, 63, 64, 65, 66, 67, 68 and 69 shall be calculated monthly and reported semi-annually.

To preclude the applicability of 401 KAR 51:017, combined sulfur dioxide emissions from emission units 15, 16, 60, 61, 62, 63, 64, 65, 66, 67, and 68 shall not exceed 36 tons in any consecutive twelve months. SO<sub>2</sub> emissions from these units shall be calculated using the following equation:

SO<sub>2</sub> emissions (tons) = [AP-42 emission factor (lbs/1000 gallons fuel burned or lbs/10<sup>6</sup>scf natural gas burned) x (1000 gallons or 10<sup>6</sup>scf) fuel burned per month / 2000 lbs/ton. To demonstrate compliance with this emission limitation, the total twelve-month rolling SO<sub>2</sub> emissions from emission units 15, 16, 60, 61, 62, 63, 64, 65, 66, 67, 68 and 69 shall be calculated monthly and reported semi-annually.

To preclude 401 KAR 51:017, carbon monoxide emissions from emission units 15, 16, 60, 61, 62, 63, 64, 65, 66, 67, 68 and 69 shall not exceed 90 tons in any consecutive twelve months. CO emissions from emission these units shall be calculated using the following equation:

CO emissions (tons) = [AP-42 emission factor (lbs/1000 gallons fuel burned or lbs/10<sup>6</sup>scf natural gas burned) x (1000 gallons or 10<sup>6</sup>scf) fuel burned per month / 2000 lbs/ton. To demonstrate compliance with this emission limitation, the total twelve-month rolling CO emissions from emission units 15, 16, 60, 61, 62, 63, 64, 65, 66, 67, 68 and 69 shall be calculated monthly and reported semi-annually.

To preclude the applicability of 401 KAR 51:017, total combined annual operating hours (12 month rolling total) for emission units 60, 61, 62, 63, 64, 65, 66, 67, 68 and 69, shall not exceed 1800 hours. To demonstrate compliance with this operating limitation, the permittee shall calculate the total twelve-month rolling hours of operation of on a monthly basis.

To preclude Section 112(j) of the Clean Air Act, source-wide emissions of Hydrogen Chloride (Single Hazardous Air Pollutant (HAP)) shall not exceed 9.0 tons in any consecutive twelve months period. HCl emissions shall be calculated using the following equation:

HCl, Single HAP Emissions (tons) = (Total tons coal burned) x (0.33 lb/ton)\* / (2000 lb/ton), \* Emission factor determined through stack testing. To demonstrate compliance with this emission limitation, the total twelve-month rolling HCl emissions shall be calculated monthly and reported semi-annually.

To preclude Section 112(j) of the Clean Air Act, the permittee shall notify the Division at least sixty (60) days prior to any change in coal supplier, fuel type, or fuel mixture, used in EU 07, 08, and 13, from those fuels used in the stack tests to establish the HCl emission factor used above for determining compliance. This notification shall include a fuel analysis of the new fuel for Hydrogen Chloride. The Division may request additional stack testing be completed in addition to this fuel analysis.

To Preclude Section 112(j) of the Clean Air Act, source-wide emissions of total Hazardous Air Pollutants (HAPs) shall not exceed 22.5 tons in any consecutive twelve months period.

To demonstrate compliance with this emission limitation, the total twelve-month rolling Total HAPs Emissions shall be calculated monthly and reported semi-annually to the Regional Office.

**CREDIBLE EVIDENCE:**

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.